

2007

DRINKING WATER SURVEILLANCE PROGRAM

**PRESCOTT
WATER TREATMENT
PLANT**

ANNUAL REPORT 1990

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PRESCOTT WATER TREATMENT PLANT
DRINKING WATER SURVEILLANCE PROGRAM
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EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM
PRESCOTT WATER TREATMENT PLANT
1990 ANNUAL REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. In 1990, 76 systems were being monitored.

The Prescott water treatment plant is a direct filtration plant which treats water from the St. Lawrence River. The process consists of coagulation, flocculation, filtration, fluoridation and disinfection. This plant has a design capacity of $8.2 \times 1000 \text{ m}^3/\text{day}$. The Prescott water treatment plant serves a population of approximately 4,600.

Water at the plant and at one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), and organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons, specific pesticides and volatiles). Samples were analyzed for specific pesticides and chlorophenols twice a year in the spring and fall.

Table A is a summary of all results by group.

No known health related guidelines were exceeded.

The Prescott water treatment plant, for the sample year 1990, produced good quality water and this was maintained in the distribution system.

TABLE A
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP

SUMMARY TABLE BY SCAN

SCAN	RAW SITE				TREATED				SITE 1			
	TESTS	POSITIVE	XPOSITIVE	TESTS	POSITIVE	XPOSITIVE	TESTS	POSITIVE	TESTS	POSITIVE	XPOSITIVE	TESTS
BACTERIOLOGICAL	18	12	66	7	2	28	7	3	42			
CHEMISTRY (FLD)	23	23	100	46	45	97	69	67	97			
CHEMISTRY (LAB)	176	148	84	176	137	77	266	227	85			
METALS	168	57	33	192	65	33	322	142	44			
CHLOROCARONATICS	70	0	0	84	0	0	98	0	0			
CHLOROPHENOLS	6	0	0	6	0	0	0	0	0			
PAH	101	0	0	101	0	0	17	0	0			
PESTICIDES & PCB	197	0	0	231	0	0	150	0	0			
PHENOLICS	7	1	14	8	0	0	0	0	0			
SPECIFIC PESTICIDES	30	0	0	31	0	0	7	0	0			
VOLATILES	232	0	0	232	32	13	203	30	14			
TOTAL	1028	241	1114	1114	281	1139	469					

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A "0" INDICATES THAT NO SAMPLE WAS TAKEN

DRINKING WATER SURVEILLANCE PROGRAM

PRESCOTT WATER TREATMENT PLANT 1990 ANNUAL REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. In 1990, 76 systems were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated for the Prescott water treatment plant in May of 1990. This is the first DWSP annual report.

PLANT DESCRIPTION

The Prescott water treatment plant is a direct filtration plant which treats water from the St. Lawrence River. The process consists of coagulation, flocculation, filtration, fluoridation and disinfection. Chlorine dioxide is generated on site to provide the disinfectant. This plant has a design capacity of $8.2 \times 1000 \text{ m}^3/\text{day}$. The Prescott water treatment plant serves a population of approximately 4,600.

The sample day flows ranged from $4.7 \times 1000 \text{ m}^3/\text{day}$ to $5.2 \times 1000 \text{ m}^3/\text{day}$.

General plant information is presented in Table 1 and a schematic of plant processes, chemical addition points and sampling locations in Figure 1.

SAMPLING AND ANALYSES

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

At all distribution system locations two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples were used to make an assessment of the change in the levels of inorganic compounds and metals, due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples therefore, were General Chemistry and Metals. The free flow

sample represented fresh water from the distribution system main, since the sample tap was flushed for five minutes prior to sampling.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. Retention time was calculated by dividing the volume of water between two sampling points by sample day flow. For example, if it was determined that retention time within the plant was five hours, then there would be a five hour interval between the raw and treated sampling. Similarly, if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

Stringent DWSP sampling protocols were followed to ensure that all samples were taken in a uniform manner (see Appendix B).

Plant operating personnel routinely analyze parameters for process control (Table 2).

Water at the plant and at one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), and organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons, specific pesticides and volatiles). Samples were analyzed for specific pesticides and chlorophenols twice a year in the spring and fall. Laboratory analyses were conducted at the Ministry of the Environment facilities in Rexdale, Ontario.

RESULTS

Field measurements were recorded on the day of sampling and were entered onto the DWSP database as submitted by plant personnel.

Table 3 contains information on delay time between raw and treated water sampling, flow rate, and treatment chemical dosages.

Table 4 is a summary break-down of the number of water samples analyzed by parameter and by water type. The number of times that a positive or trace result was detected is also reported.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 presents the results for parameters detected on at least one occasion.

Table 6 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on Tables 5 and 6. Parameters are listed alphabetically within each scan.

DISCUSSION

GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOs). When an Ontario Drinking Water Objective (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

IN THIS REPORT, DISCUSSION IS LIMITED TO:

- **THE TREATED AND DISTRIBUTED WATER;**
- **ONLY THOSE PARAMETERS WITH CONCENTRATIONS ABOVE GUIDELINE VALUES; AND**
- **POSITIVE ORGANIC PARAMETERS DETECTED.**

BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples.

Standard plate count was the only bacteriological analysis conducted on the treated and distributed water. No results were reported above the guideline.

INORGANIC & PHYSICAL

CHEMISTRY (FIELD)

It is desirable that the temperature of drinking water be less than 15°C. The palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The temperature of the delivered water may increase in the distribution system due to the warming effect of the soil in late summer and fall and/or as a result of higher

temperatures in the source water.

Field temperature exceeded the ODWO Maximum Desirable Concentration of 15°C in 7 of 15 treated and distributed water samples with a maximum reported value of 20.0°C.

CHEMISTRY (LAB)

The ODWOs indicate that a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters provides an acceptable balance between corrosion and encrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and would possess a tendency to form scale deposits and result in excessive soap consumption.

Hardness exceeded the ODWO Aesthetic or Recommended Operational Guideline of 80-100 mg/L in all 15 treated and distributed water samples with a maximum reported value of 138.5 mg/L.

Turbidity in water is caused by the presence of suspended matter such as clay, silt, colloidal particles, plankton and other microscopic organisms. The most important potential health effect of turbidity is its interference with disinfection in the treatment plant and the maintenance of a chlorine residual. The ODWO Maximum Acceptable Concentration for turbidity is 1.0 Formazin Turbidity Units (FTU).

The laboratory turbidity exceeded the Maximum Acceptable Concentration in 1 of 8 treated water samples with a reported value of 1.3 FTU. These results were not confirmed by the more reliable field turbidity results.

METALS

At present, there is no evidence that aluminum is physiologically harmful and no health limit for drinking water has been specified. The measure of aluminum in treated water is important to indicate the efficiency of the treatment process. The ODWOs indicate that a useful guideline is to maintain a residual below 100 ug/L as aluminum in the water leaving the plant, to avoid problems in the distribution system.

Aluminum exceeded the ODWO Aesthetic or Recommended Operational Guideline of 100 ug/L in 11 of 15 treated and distributed water samples with a maximum reported value of 280.0 ug/L.

ORGANIC

CHLOROAROMATICS

The results of the chloroaromatic scan showed that none were detected above trace levels.

CHLOROPHENOLS

The results of the chlorophenol scan showed that none were detected.

POLYAROMATIC HYDROCARBONS (PAH)

The results of the PAH scan showed that one parameter was detected at a trace level in one distribution system sample.

PESTICIDES & PCB

The results of the PCB scan showed that none were detected.

The results of the regular pesticide scan showed that none were detected above trace levels.

PHENOLICS

Phenolic compounds are present in the aquatic environment as a result of natural and/or industrial processes. The ODWOs recommend, as an operational guideline, that phenolic substances in drinking water not exceed 2.0 ug/L. This limit has been set primarily to prevent undesirable taste and odours, particularly in chlorinated water. No results exceeded the guideline.

SPECIFIC PESTICIDES

The results of the specific pesticides scan showed that none were detected.

VOLATILES

Tetrachloroethylene was detected at positive levels in 2 distribution system samples with a maximum reported value of 0.8 ug/L. The World Health Organization has a Tentative Guideline Value of 10 ug/L. Trace levels of tetrachloroethylene were detected in the majority of samples from that distribution system site; none was detected in the raw or treated water samples.

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology.

Trihalomethanes (THMs) are produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of chloroform, chlorodibromomethane and dichlorobromomethane; bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs. Only total THMs results are discussed.

Total THMs was found at positive levels in the 15 treated and distributed water samples analyzed with a maximum level of 49.1 ug/L. This was below the ODWO Maximum Acceptable Concentration of 350 ug/L.

CONCLUSIONS

The Prescott water treatment plant, for the sample year 1990, produced good quality water and this was maintained in the distribution system.

No known health related guidelines were exceeded.

FIGURE 1
PRESCOTT WTP

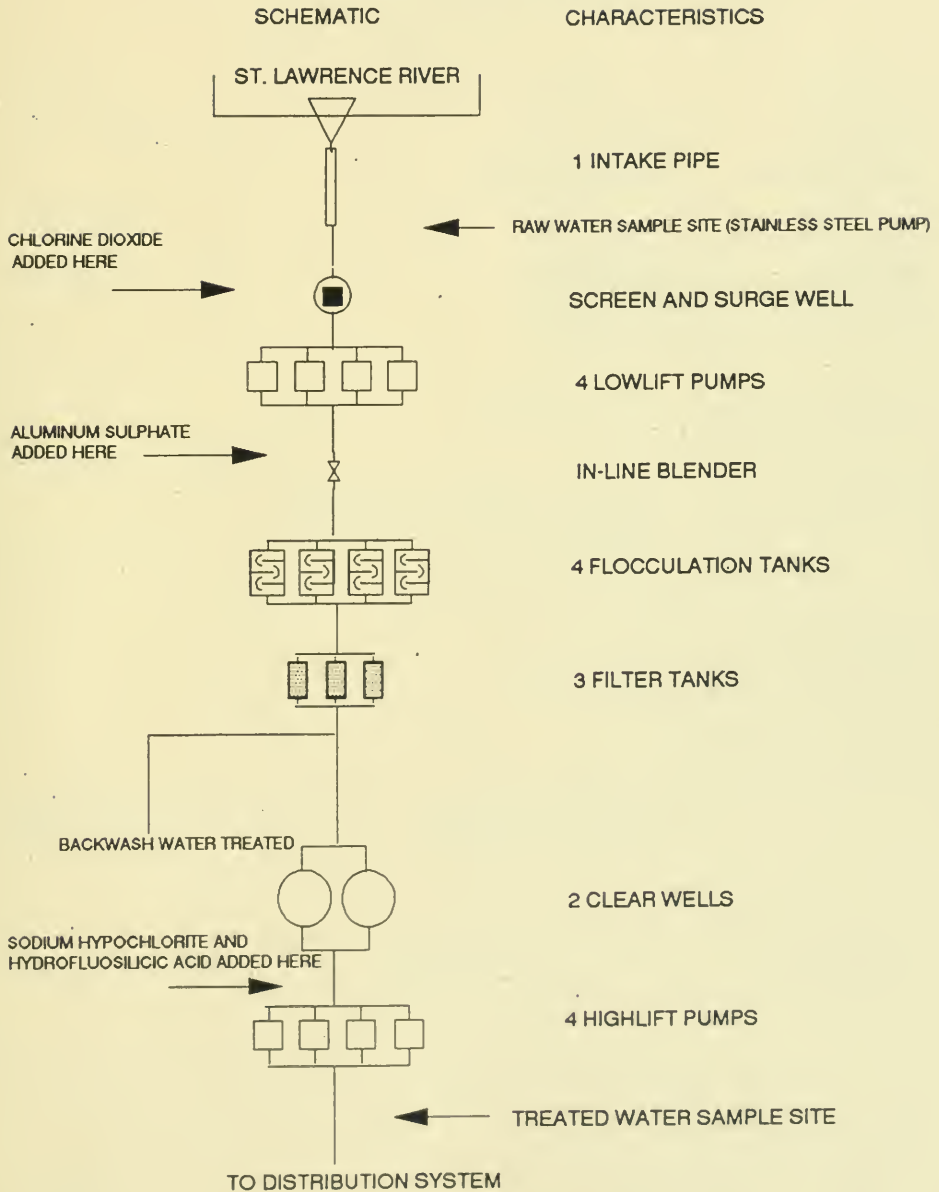


TABLE 1
DRINKING WATER SURVEILLANCE PROGRAM
PLANT GENERAL REPORT

WORKS #: 220001245
PLANT NAME: PRESCOTT WTP

DISTRICT: KINGSTON
REGION: SOUTHEAST
DISTRICT OFFICER: M. HOLY

UTM #: 184587504949840

CHIEF OPERATOR: KEITH KELSO

ADDRESS:
PRESCOTT PUBLIC UTILITIES
255 GEORGE ST.
KOE 1T0
(613-925-2179)

MUNICIPALITY: PRESCOTT
AUTHORITY: MUNICIPAL

PLANT INFORMATION

PLANT VOLUME:	-	(X 1000 M3)
DESIGN CAPACITY:	8.200	(X 1000 M3/DAY)
RATED CAPACITY:	-	(X 1000 M3/DAY)

MUNICIPALITY

PRESCOTT

POPULATION

4,584

TABLE 2
DRINKING WATER SURVEILLANCE PROGRAM
IN-PLANT MONITORING

PARAMETER -----	LOCATION -----	FREQUENCY -----
FREE CHLORINE RESIDUAL	AFTER FILTERS	CONTINUOUS
PH	RAW WATER	CONTINUOUS
	TREATED WATER	CONTINUOUS
TEMPERATURE	RAW WATER	CONTINUOUS
TURBIDITY	AFTER DISINFECTION	CONTINUOUS
	AFTER FILTERS	CONTINUOUS
	HIGHLIFT DISCHARGE	CONTINUOUS
	TREATED WATER	EVERY 2 HOURS

TABLE 3
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP SAMPLE DAY CONDITIONS FOR 1990

TREATMENT CHEMICAL DOSAGE (MG/L)

DATE	DELAY * TIME(HRS)	FLOW (1000M3)	PRE CHLORINATION		COAGULATION ALUM LIQUID	POST CHLORINATION SODIUM HYPOCHLORITE	FLUORIDATION HYDROFLUOSILICIC ACID
			CHLORINE	SODIUM CHLORITE			
JUN 19	9.50	4.757		.30	5.60	.73	1.20
JUL 17	9.00	5.027		.36	5.50	.73	1.20
AUG 21	9.00	5.031		.37	6.00	.77	1.05
SEP 18	9.00	5.059		.36	6.00	.78	1.10
OCT 16	9.00	5.107		.37		1.00	1.20
NOV 20	9.00	5.192		.34	5.50	.90	1.20
DEC 18	9.00	4.821		.35	5.00	.90	1.20

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE

BACTERIOLOGICAL									
FECAL COLIFORM MF	6	4	0	.	.	.	.	.	.
STANDARD PLATE CNT MF	.	.	.	7	2	0	7	3	0
TOTAL COLIFORM MF	6	2	0	.	.	.	.	.	.
T COLIFORM BCKGRD MF	6	6	0	.	.	.	.	.	.
*TOTAL GROUP BACTERIOLOGICAL	18	12	0	7	2	0	7	3	0

CHEMISTRY (FLD)									
FLD CHLORINE (COMB)	.	.	.	8	7	0	13	11	0
FLD CHLORINE FREE	.	.	.	8	8	0	14	14	0
FLD CHLORINE (TOTAL)	.	.	.	8	8	0	14	14	0
FLD PH	8	8	0	8	8	0	14	14	0
FLD TEMPERATURE	8	8	0	8	8	0	14	14	0
FLD TURBIDITY	7	7	0	6	6	0	.	.	.
*TOTAL SCAN CHEMISTRY (FLD)	23	23	0	46	45	0	69	67	0

CHEMISTRY (LAB)									
ALKALINITY	8	8	0	8	8	0	14	14	0
CALCIUM	8	8	0	8	8	0	14	14	0
CYANIDE	8	0	0	8	0	0	.	.	.
CHLORIDE	8	8	0	8	8	0	14	14	0
COLOUR	8	4	3	8	0	8	14	0	12
CONDUCTIVITY	8	8	0	8	3	0	14	14	0
DISS ORG CARBON	8	8	0	8	8	0	14	14	0
FLUORIDE	8	8	0	8	8	0	14	14	0
HARDNESS	8	8	0	8	8	0	14	14	0
IONCAL	8	8	0	8	8	0	14	14	0
LANGELIERS INDEX	8	8	0	8	8	0	14	14	0
MAGNESIUM	8	8	0	8	8	0	14	14	0
SODIUM	8	8	0	8	8	0	14	14	0
AMMONIUM TOTAL	8	3	1	8	0	4	14	2	5
NITRITE	8	6	1	8	1	4	14	1	12
TOTAL NITRATES	8	8	0	8	8	0	14	14	0
NITROGEN TOT KJELD	8	8	0	8	8	0	14	14	0
PH	8	8	0	8	8	0	14	14	0
PHOSPHORUS FIL REACT	8	1	4	8	6	2	.	.	.
PHOSPHORUS TOTAL	8	6	2	8	5	3	.	.	.
SULPHATE	8	8	0	8	8	0	14	14	0
TURBIDITY	8	8	0	8	5	3	14	14	0
*TOTAL SCAN CHEMISTRY (LAB)	176	148	11	176	137	24	266	227	29

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP
SUMMARY TABLE OF RESULTS (1990)

	RAW				TREATED				SITE 1	
SCAN PARAMETER	TOTAL POSITIVE TRACE				TOTAL POSITIVE TRACE				TOTAL POSITIVE TRACE	

METALS										
SILVER	7	0	0	8	0	0	14	0	0	
ALUMINUM	7	7	0	8	8	0	14	14	0	
ARSENIC	7	1	6	8	1	7	14	3	11	
BARIUM	7	7	0	8	8	0	14	14	0	
BORON	7	7	0	8	8	0	14	14	0	
BERYLLIUM	7	0	0	8	0	0	14	0	0	
CADMIUM	7	0	1	8	0	1	14	0	2	
COBALT	7	0	7	8	0	6	14	0	11	
CHROMIUM	7	0	6	8	0	7	14	0	13	
COPPER	7	0	7	8	0	8	14	14	0	
IRON	7	0	7	8	0	2	14	2	11	
MERCURY	7	0	0	8	0	0	.	.	.	
MANGANESE	7	7	0	8	6	2	14	14	0	
MOLYBDENUM	7	7	0	8	8	0	14	14	0	
NICKEL	7	1	4	8	0	6	14	1	9	
LEAD	7	2	5	8	1	7	14	12	2	
ANTIMONY	7	4	3	8	7	1	14	12	2	
SELENIUM	7	0	1	8	0	4	14	0	11	
STRONTIUM	7	7	0	8	8	0	14	14	0	
TITANIUM	7	2	5	8	3	5	14	0	14	
THALLIUM	7	0	0	8	0	0	14	0	0	
URANIUM	7	0	7	8	0	8	14	0	14	
VANADIUM	7	0	7	8	0	8	14	0	14	
ZINC	7	5	2	8	7	1	14	14	0	

*TOTAL SCAN METALS	168	57	68	192	65	73	322	142	114	
*TOTAL GROUP INORGANIC & PHYSICAL	367	228	79	414	247	97	657	436	143	

CHLOROAROMATICS										
HEXACHLOROBUTADIENE	5	0	0	6	0	0	7	0	0	
123 TRICHLOROBENZENE	5	0	0	6	0	0	7	0	0	
1234 T-CHLOROBENZENE	5	0	0	6	0	0	7	0	0	
1235 T-CHLOROBENZENE	5	0	0	6	0	0	7	0	0	
124 TRICHLOROBENZENE	5	0	0	6	0	0	7	0	0	
1245 T-CHLOROBENZENE	5	0	0	6	0	0	7	0	0	
135 TRICHLOROBENZENE	5	0	0	6	0	0	7	0	0	
HCB	5	0	0	6	0	0	7	0	0	
HEXACHLOROETHANE	5	0	0	6	0	1	7	0	2	
OCTACHLOROSTYRENE	5	0	0	6	0	0	7	0	0	
PENTACHLOROBENZENE	5	0	0	6	0	0	7	0	0	
236 TRICHLOROTOLUENE	5	0	0	6	0	0	7	0	0	
245 TRICHLOROTOLUENE	5	0	0	6	0	0	7	0	0	
26A TRICHLOROTOLUENE	5	0	0	6	0	0	7	0	0	

*TOTAL SCAN CHLOROAROMATICS	70	0	0	84	0	1	98	0	2	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE

CHLOROPHENOLS									
234 TRICHLOROPHENOL	1	0	0	1	0	0	.	.	.
2345 T-CHLOROPHENOL	1	0	0	1	0	0	.	.	.
2356 T-CHLOROPHENOL	1	0	0	1	0	0	.	.	.
245-TRICHLOROPHENOL	1	0	0	1	0	0	.	.	.
246-TRICHLOROPHENOL	1	0	0	1	0	0	.	.	.
PENTACHLOROPHENOL	1	0	0	1	0	0	.	.	.
*TOTAL SCAN CHLOROPHENOLS	6	0	0	6	0	0	0	0	0

PAH									
PHENANTHRENE	6	0	0	6	0	0	1	0	1
ANTHRACENE	6	0	0	6	0	0	1	0	0
FLUORANTHENE	6	0	0	6	0	0	1	0	0
PYRENE	6	0	0	6	0	0	1	0	0
BENZO(A)ANTHRACENE	6	0	0	6	0	0	1	0	0
CHRYSENE	6	0	0	6	0	0	1	0	0
DIMETH. BENZ(A)ANTHR	6	0	0	6	0	0	1	0	0
BENZO(E) PYRENE	6	0	0	6	0	0	1	0	0
BENZO(B) FLUORANTHEN	6	0	0	6	0	0	1	0	0
PERYLENE	6	0	0	6	0	0	1	0	0
BENZO(K) FLUORANTHEN	6	0	0	6	0	0	1	0	0
BENZO(A) PYRENE	5	0	0	5	0	0	1	0	0
BENZO(G,H,I) PERYLEN	6	0	0	6	0	0	1	0	0
DIBENZO(A,H) ANTHRAC	6	0	0	6	0	0	1	0	0
INDENO(1,2,3-C,D) PY	6	0	0	6	0	0	1	0	0
BENZO(B) CHRYSENE	6	0	0	6	0	0	1	0	0
CORONENE	6	0	0	6	0	0	1	0	0
*TOTAL SCAN PAH	101	0	0	101	0	0	17	0	1

PESTICIDES & PCB									
ALDRIN	5	0	0	6	0	0	7	0	0
ALPHA BHC	5	0	3	6	0	3	7	0	5
BETA BHC	5	0	0	6	0	0	7	0	0
LINDANE	5	0	0	6	0	0	7	0	1
ALPHA CHLORDANE	5	0	0	6	0	0	7	0	0
GAMMA CHLORDANE	5	0	0	6	0	0	7	0	0
DIELDRIN	5	0	0	6	0	0	7	0	0
METHOXYCHLOR	5	0	0	6	0	0	7	0	0
ENDOSULFAN I	5	0	0	6	0	0	7	0	0
ENDOSULFAN II	5	0	0	6	0	0	7	0	0
ENDRIN	5	0	0	6	0	0	7	0	0
ENDOSULFAN SULPHATE	5	0	0	6	0	0	7	0	0
HEPTACHLOR EPOXIDE	5	0	0	6	0	0	7	0	0
HEPTACHLOR	5	0	0	6	0	0	7	0	0
MIREX	5	0	0	6	0	0	7	0	0
OXYCHLORDANE	5	0	0	6	0	0	7	0	0
OPDDT	5	0	0	6	0	0	7	0	0
PCB	5	0	0	6	0	0	7	0	0
DDD	5	0	0	6	0	0	7	0	0
PPDDE	5	0	0	6	0	0	7	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PPDDT	5	0	0	6	0	0	7	0	0
AMETRINE	7	0	0	8	0	0	.	.	.
ATRAZINE	7	0	2	8	0	2	.	.	.
ATRAZONE	7	0	0	8	0	0	.	.	.
CYANAZINE (BLADEX)	7	0	0	8	0	0	.	.	.
DESETHYLATRAZINE	7	0	0	8	0	0	.	.	.
D-ETHYL-SIMAZINE	6	0	0	7	0	0	.	.	.
PROMETONE	7	0	0	8	0	0	.	.	.
PROPAZINE	7	0	0	8	0	0	.	.	.
PROMETRYNE	7	0	0	8	0	0	.	.	.
METRIBUZIN (SENCOR)	7	0	0	8	0	0	.	.	.
SIMAZINE	7	0	0	8	0	0	.	.	.
ALACHLOR (LASSO)	7	0	0	8	0	0	.	.	.
METOLACHLOR	7	0	0	8	0	0	.	.	.
HEXACHLOROCYCLOPENTADIEN	2	0	0	2	0	0	3	0	0
*TOTAL SCAN PESTICIDES & PCB	197	0	5	231	0	5	150	0	6

PHENOLICS									
PHENOLICS	7	1	1	8	0	3	.	.	.
*TOTAL SCAN PHENOLICS	7	1	1	8	0	3	0	0	0

SPECIFIC PESTICIDES									
TOXAPHENE	5	0	0	6	0	0	7	0	0
2,4,5-T	1	0	0	1	0	0	.	.	.
2,4-D	1	0	0	1	0	0	.	.	.
2,4-DB	1	0	0	1	0	0	.	.	.
2,4 D PROPIONIC ACID	1	0	0	1	0	0	.	.	.
DICAMBA	1	0	0	1	0	0	.	.	.
PICHLORAM	0	0	0	0	0	0	.	.	.
SILVEX	1	0	0	1	0	0	.	.	.
DIAZINON	1	0	0	1	0	0	.	.	.
DICHLOROVOS	1	0	0	1	0	0	.	.	.
CHLORPYRIFOS	1	0	0	1	0	0	.	.	.
ETHION	1	0	0	1	0	0	.	.	.
AZINPHOS-METHYL	0	0	0	0	0	0	.	.	.
MALATHION	1	0	0	1	0	0	.	.	.
MEVINPHOS	1	0	0	1	0	0	.	.	.
METHYL PARATHION	1	0	0	1	0	0	.	.	.
METHYLTRITHION	1	0	0	1	0	0	.	.	.
PARATHION	1	0	0	1	0	0	.	.	.
PHORATE	0	0	0	0	0	0	.	.	.
RELDAN	1	0	0	1	0	0	.	.	.
RONNEL	1	0	0	1	0	0	.	.	.
AMINOCARB	0	0	0	0	0	0	.	.	.
BENONYL	0	0	0	0	0	0	.	.	.
BUX	0	0	0	0	0	0	.	.	.
CARBOFURAN	1	0	0	1	0	0	.	.	.
CICP	1	0	0	1	0	0	.	.	.
DIALATE	1	0	0	1	0	0	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1	
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE
EPTAM	1	0	0	1	0	0	.	.
IPC	1	0	0	1	0	0	.	.
PROPOXUR	1	0	0	1	0	0	.	.
CARBARYL	1	0	0	1	0	0	.	.
BUTYLATE	1	0	0	1	0	0	.	.
*TOTAL SCAN SPECIFIC PESTICIDES	30	0	0	31	0	0	7	0
VOLATILES								
BENZENE	8	0	0	8	0	1	7	0
TOLUENE	8	0	0	8	0	2	7	0
ETHYLBENZENE	8	0	0	8	0	2	7	0
P-XYLENE	8	0	0	8	0	0	7	0
M-XYLENE	8	0	0	8	0	0	7	0
O-XYLENE	8	0	0	8	0	0	7	0
STYRENE	8	0	1	8	0	2	7	0
1,1 DICHLOROETHYLENE	8	0	0	8	0	0	7	0
METHYLENE CHLORIDE	8	0	0	8	0	0	7	0
1,1,2 DICHLOROETHYLENE	8	0	0	8	0	0	7	0
1,1 DICHLORODETHANE	8	0	0	8	0	0	7	0
CHLOROFORM	8	0	0	8	8	0	7	7
111, TRICHLOROETHANE	8	0	0	8	0	0	7	0
1,2 DICHLOROETHANE	8	0	0	8	0	0	7	0
CARBON TETRACHLORIDE	8	0	0	8	0	0	7	0
1,2 DICHLOROPROPANE	8	0	0	8	0	0	7	0
TRICHLOROETHYLENE	8	0	0	8	0	0	7	0
DICHLOROBROMOMETHANE	8	0	0	8	8	0	7	7
112 TRICHLOROETHANE	8	0	0	8	0	0	7	0
CHLORODIBROMOMETHANE	8	0	0	8	8	0	7	7
T-CHLOROETHYLENE	8	0	0	8	0	0	7	2
BROMOFORM	8	0	0	8	0	8	7	0
1122 T-CHLOROETHANE	8	0	0	8	0	0	7	0
CHLOROBENZENE	8	0	0	8	0	0	7	0
1,4 DICHLOROBENZENE	8	0	0	8	0	0	7	0
1,3 DICHLOROBENZENE	8	0	0	8	0	0	7	0
1,2 DICHLOROBENZENE	8	0	0	8	0	0	7	0
ETHYLENE DIBROMIDE	8	0	0	8	0	0	7	0
TOTL TRIHALOMETHANES	8	0	0	8	8	0	7	7
*TOTAL SCAN VOLATILES	232	0	1	232	32	15	203	35
*TOTAL GROUP ORGANIC	643	1	7	693	32	24	475	30

KEY TO TABLE 5 and 6

- A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
1. Maximum Acceptable Concentration (MAC)
1+. MAC for Total Trihalomethanes
2. Interim Maximum Acceptable Concentration (IMAC)
3. Aesthetic Objective (AO)
3*. AO for Total Xylenes
4. Recommended Operational Guideline
- B HEALTH & WELFARE CANADA (H&W)
1. Maximum Acceptable Concentration (MAC)
2. Proposed MAC
3. Interim MAC
4. Aesthetic Objective (AO)
- C WORLD HEALTH ORGANIZATION (WHO)
1. Guideline Value (GV)
2. Tentative GV
3. Aesthetic GV
- D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
2. Suggested No-Adverse Effect Level (SNAEL)
3. Lifetime Health Advisory
4. EPA Ambient Water Quality Criteria
4T. EPA Ambient Water Quality Criteria for Total PAH
- F EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
2. Aesthetic Guideline Level
3. Maximum Admissible Concentration (MADC)
- G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE
- I NEW YORK STATE AMBIENT WATER GUIDELINE
- N/A NONE AVAILABLE

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurement Amount
<T	Greater Than Detection Limit But Not Confident (SEE INTERPRETATION OF RESULTS ABOVE)
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!CS	No Data: Contamination Suspected
!IL	No Data: Sample Incorrectly Labelled
!IS	No Data: Insufficient Sample
!IV	No Data: Inverted Septum
!LA	No Data: Laboratory Accident
!LD	No Data: Test Queued After Sample Discarded
!NA	No Data: No Authorization To Perform Reanalysis
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!QU	No Data: Quality Control Unacceptable
!PE	No Data: Procedural Error - Sample Discarded
!PH	No Data: Sample pH Outside Valid Range
!RE	No Data: Received Empty
!RO	No Data: See Attached Report (no numeric results)
!SM	No Data: Sample Missing
!SS	No Data: Send Separate Sample Properly Preserved
!UI	No Data: Indeterminant Interference
!TX	No Data: Time Expired
A3C	Approximate, Total Count Exceeded 300 Colonies
APL	Additional Peak, Large, Not Priority Pollutant
APS	Additional Peak, Less Than, Not Priority Pollutant
CIC	Possible Contamination, Improper Cap
CRO	Calculated Result Only
PPS	Test Performed On Preserved Sample
RMP	P and M-Xylene Not Separated
RRV	Rerun Verification
RVU	Reported Value Unusual
SPS	Several Peaks, Small, Not Priority Pollutant

UCR Unreliable: Could Not Confirm By Reanalysis
UCS Unreliable: Contamination Suspected
UIN Unreliable: Indeterminate Interference
XP Positive After X Number Of Hours
T# (T06) Result Taken After # Hours

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW

TREATED

SITE 1

STANDING

FREE FLOW

BACTERIOLOGICAL
FECAL COLIFORM MF (CT/100ML)

DET'N LIMIT = 0

GUIDELINE = 0 (A1)

MAY	BDL	.	.	.
JUN	1	.	.	.
SEP	32	.	.	.
OCT	8	.	.	.
NOV	12	.	.	.
DEC	BDL	.	.	.

STANDRD PLATE CNT MF (COUNT/ML)

DET'N LIMIT = 0

GUIDELINE = 500/ML (A3)

MAY	.	1 <=>	.	.
JUN	.	55	.	63
JUL	.	11	.	390
AUG	.	.	.	64
SEP	.	2 <=>	.	0 <=>
OCT	.	6 <=>	.	4 <=>
NOV	.	1 <=>	.	0 <=>
DEC	.	0 <=>	.	0 <=>

TOTAL COLIFORM MF (CT/100ML)

DET'N LIMIT = 0

GUIDELINE = 5/100ML(A1)

MAY	120	.	.	.
JUN	150	.	.	.
SEP	180 <=>	.	.	.
OCT	40 <=>	.	.	.
NOV	30 <=>	.	.	.
DEC	70 <=>	.	.	.

T COLIFORM BCKGRD MF (CT/100ML)

DET'N LIMIT = 0

GUIDELINE = N/A

MAY	8600	.	.	.
JUN	19000	.	.	.
SEP	42000	.	.	.
OCT	5200	.	.	.
NOV	1100	.	.	.
DEC	400	.	.	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW		TREATED		SITE 1	
		STANDING		FREE FLOW	

CHEMISTRY (FLD)					
FLD CHLORINE (COMB) (MG/L)			DET'N LIMIT = 0		GUIDELINE = N/A
MAY	.	.300	.	.	
JUN	.	.200	.200	.300	
JUL	.	.200	.200	.200	
AUG	.	.200	.	.200	
SEP	.	.200	.000	.200	
OCT	.	.400	.000	.200	
NOV	.	.200	.200	.200	
DEC	.	.000	.200	.300	

FLD CHLORINE FREE (MG/L)			DET'N LIMIT = 0		GUIDELINE = N/A
MAY	.	.600	.	.	
JUN	.	.550	.100	.100	
JUL	.	.500	.100	.300	
AUG	.	.700	.100	.100	
SEP	.	.700	.100	.300	
OCT	.	.500	.100	.300	
NOV	.	.700	.100	.500	
DEC	.	.600	.100	.300	

FLD CHLORINE (TOTAL) (MG/L)			DET'N LIMIT = 0		GUIDELINE = N/A
MAY	.	.900	.	.	
JUN	.	.750	.300	.400	
JUL	.	.700	.300	.500	
AUG	.	.900	.100	.300	
SEP	.	.900	.100	.500	
OCT	.	.900	.100	.500	
NOV	.	.900	.300	.700	
DEC	.	.600	.300	.600	

FLD PH (DMNSLESS)			DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5(A4)
MAY	8.000	7.600	.	.	
JUN	8.200	7.600	7.600	7.600	
JUL	8.200	7.400	7.600	7.600	
AUG	8.000	7.400	7.600	7.600	
SEP	7.600	7.400	7.600	7.600	
OCT	7.800	7.400	7.600	7.600	
NOV	7.500	7.400	7.600	7.600	
DEC	7.500	7.400	7.600	7.600	

FLD TEMPERATURE (DEG.C)			DET'N LIMIT = N/A		GUIDELINE = 15 (A3)
MAY	8.000	10.200	.	.	
JUN	13.000	14.000	18.000	17.000	
JUL	19.600	18.000	19.000	17.000	
AUG	20.000	20.000	22.000	19.000	
SEP	18.200	17.000	18.000	16.500	
OCT	14.100	13.000	16.000	14.000	
NOV	6.900	.500	17.000	9.000	
DEC	3.900	3.900	16.500	6.000	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

		RAW	TREATED	SITE 1	
				STANDING	FREE FLOW
FLD TURBIDITY (FTU)				DET'N LIMIT = N/A	GUIDELINE = 1 (A1)
MAY	.960		.240	.	.
JUN	.900		.100	.	.
JUL	.600		.110	.	.
AUG	.500		.060	.	.
SEP	.500		.	.	.
OCT	.500		.	.	.
NOV	.500		.080	.	.
DEC	.		.060	.	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW		TREATED	SITE 1	
			STANDING	FREE FLOW
CHEMISTRY (LAB)				
ALKALINITY (MG/L)		DET'N LIMIT = 0.2		GUIDELINE = 30-500 (A3)
MAY	99.900	96.500	.	.
JUN	99.300	94.900	95.200	95.200
JUL	97.300	94.300	95.500	94.600
AUG	93.200	87.700	88.700	88.000
SEP	94.100	88.600	90.000	88.700
OCT	97.600	91.600	92.600	92.200
NOV	100.500	95.000	96.100	94.800
DEC	99.400	93.600	96.000	95.700
CALCIUM (MG/L)		DET'N LIMIT = 0.2		GUIDELINE = 100 (F2)
MAY	40.800	40.400	.	.
JUN	39.200	38.600	39.000	39.000
JUL	37.800	40.500	40.700	40.400
AUG	36.600	36.800	37.000	37.000
SEP	38.200	38.400	38.800	39.400
OCT	40.400	39.900	40.000	40.700
NOV	41.000	41.000	40.800	40.700
DEC	39.400	39.000	38.800	38.800
CHLORIDE (MG/L)		DET'N LIMIT = 0.2		GUIDELINE = 250 (A3)
MAY	20.800	23.500	.	.
JUN	21.300	23.700	23.700	23.600
JUL	20.800	23.300	23.800	23.700
AUG	21.900	24.700	25.200	25.200
SEP	21.900	24.700	24.200	24.000
OCT	22.400	25.000	25.400	25.200
NOV	24.100	24.400	24.700	24.400
DEC	21.900	24.300	24.400	24.300
COLOUR (HZU)		DET'N LIMIT = 0.5		GUIDELINE = 5 (A3)
MAY	3.500	1.000 <T	.	.
JUN	3.000	1.000 <T	BDL	.500 <T
JUL	3.000	.500 <T	BDL	.500 <T
AUG	BDL	.500 <T	1.500 <T	.500 <T
SEP	1.500 <T	1.000 <T	1.000 <T	1.500 <T
OCT	2.500	1.000 <T	1.000 <T	.500 <T
NOV	2.000 <T	.500 <T	.500 <T	1.000 <T
DEC	1.500 <T	.500 <T	1.000 <T	.500 <T
CONDUCTIVITY (UMHO/CM)		DET'N LIMIT = 1.		GUIDELINE = 400 (F2)
MAY	314	324	.	.
JUN	313	322	322	322
JUL	313	325	328	327
AUG	307	318	320	318
SEP	305	314	318	311
OCT	321	331	332	332
NOV	325	333	335	334
DEC	319	326	330	330

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW

TREATED

SITE 1

		STANDING		FREE FLOW	
DISS ORG CARBON (MG/L)		DET'N LIMIT = .100		GUIDELINE = 5.0 (A3)	
MAY	2.300	2.300	.	.	.
JUN	2.200	2.100	2.000	2.100	.
JUL	2.200	2.200	2.000	2.200	.
AUG	2.000	1.800	1.800	1.900	.
SEP	1.900	1.800	1.600	1.800	.
OCT	1.000	.800	2.400	.600	.
NOV	2.000	1.800	1.600	1.800	.
DEC	2.000	1.900	1.800	1.800	.
FLUORIDE (MG/L)		DET'N LIMIT = 0.01		GUIDELINE = 2.4 (A1)	
MAY	.120	1.060	.	.	.
JUN	.120	1.180	1.120	1.140	.
JUL	.160	1.100	1.160	1.180	.
AUG	.120	1.180	1.120	1.200	.
SEP	.120	1.260	1.220	1.300	.
OCT	.120	1.360	1.340	1.320	.
NOV	.120	1.060	.980	1.060	.
DEC	.140	1.240	1.260	1.240	.
HARDNESS (MG/L)		DET'N LIMIT = 0.5		GUIDELINE = 80-100 (A4)	
MAY	136.000	133.000	.	.	.
JUN	132.000	130.000	131.000	130.000	.
JUL	128.000	134.400	135.700	134.600	.
AUG	125.000	126.000	127.000	127.000	.
SEP	131.000	130.000	131.000	130.000	.
OCT	136.000	135.000	135.000	137.000	.
NOV	139.100	138.200	138.100	138.500	.
DEC	132.000	133.000	132.000	133.000	.
IONCAL (DMNSLESS)		DET'N LIMIT = N/A		GUIDELINE = N/A	
MAY	2.001	1.225	.	.	.
JUN	.716	.277	.410	.036	.
JUL	1.144	3.314	3.043	3.145	.
AUG	.689	.839	.380	.307	.
SEP	1.785	2.429	2.388	.934	.
OCT	3.382	3.829	2.510	4.386	.
NOV	1.328	3.510	2.072	3.239	.
DEC	1.682	.168	2.184	1.853	.
LANGELIERS INDEX (DMNSLESS)		DET'N LIMIT = N/A		GUIDELINE = N/A	
MAY	.558	.397	.	.	.
JUN	.438	.330	.246	.296	.
JUL	.183	.308	.326	.298	.
AUG	.391	.316	.283	.280	.
SEP	.345	.269	.200	.321	.
OCT	.392	.319	.314	.330	.
NOV	.571	.496	.489	.482	.
DEC	.390	.158	.157	.155	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW

TREATED

SITE 1

		STANDING		FREE FLOW	
MAGNESIUM (MG/L)		DET'N LIMIT = 0.10		GUIDELINE = 30 (F2)	
MAY	8.200	7.900	.	7.900	.
JUN	8.200	8.200	8.200	7.900	.
JUL	8.200	8.100	8.300	8.200	.
AUG	8.300	8.300	8.500	8.300	.
SEP	8.600	8.400	8.300	7.700	.
OCT	8.600	8.500	8.650	8.600	.
NOV	8.950	8.700	8.800	8.900	.
DEC	8.300	8.600	8.500	8.700	.
SODIUM (MG/L)		DET'N LIMIT = 0.2		GUIDELINE = 200 (A4)	
MAY	11.000	12.400	.	12.500	.
JUN	10.900	12.700	12.400	12.500	.
JUL	11.400	13.300	13.300	13.300	.
AUG	11.600	13.400	13.000	12.800	.
SEP	11.600	12.800	12.800	11.400	.
OCT	12.600	14.100	13.300	13.400	.
NOV	11.900	13.100	12.600	12.700	.
DEC	11.600	12.200	12.600	12.400	.
AMMONIUM TOTAL (MG/L)		DET'N LIMIT = 0.002		GUIDELINE = 0.05 (F2)	
MAY	.010	BDL	.	BDL	.
JUN	BDL	BDL	BDL	BDL	.
JUL	BDL	.002 <T	.002 <T	BDL	.
AUG	.002 <T	.002 <T	.008 <T	.006 <T	.
SEP	BDL	.002 <T	BDL	BDL	.
OCT	.018	BDL	.010	BDL	.
NOV	.022	.006 <T	.014	.004 <T	.
DEC	BDL	BDL	.004 <T	BDL	.
NITRITE (MG/L)		DET'N LIMIT = 0.001		GUIDELINE = 1 (A1)	
MAY	.013	.002 <T	.	.	.
JUN	.006	.007	.004 <T	.006	.
JUL	BDL	BDL	.002 <T	.001 <T	.
AUG	.005	BDL	.002 <T	.002 <T	.
SEP	.005	.004 <T	.003 <T	.002 <T	.
OCT	.013	BDL	.003 <T	.001 <T	.
NOV	.004 <T	.001 <T	.003 <T	.001 <T	.
DEC	.008	.001 <T	.001 <T	BDL	.
TOTAL NITRATES (MG/L)		DET'N LIMIT = 0.005		GUIDELINE = 10 (A1)	
MAY	.335	.360	.	.	.
JUN	.305	.245	.250	.225	.
JUL	.310	.315	.315	.290	.
AUG	.160	.165	.165	.170	.
SEP	.230	.180	.180	.175	.
OCT	.250	.245	.260	.240	.
NOV	.225	.225	.225	.220	.
DEC	.290	.280	.280	.275	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

		RAW	TREATED	SITE 1	
				STANDING	FREE FLOW
NITROGEN TOT KJELD (MG/L)				DET'N LIMIT = 0.02	GUIDELINE = N/A
MAY	.190	.190	.	.	.
JUN	.290	.180	.220	.230	.
JUL	.280	.190	.200	.180	.
AUG	.220	.120	.170	.140	.
SEP	.400	.170	.180	.180	.
OCT	.240	.180	.200	.170	.
NOV	.180	.120	.130	.150	.
DEC	.240	.140	.190	.150	.
PH (DMMSLESS)				DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5(A4)
MAY	8.390	8.250	.	.	.
JUN	8.290	8.210	8.120	8.170	.
JUL	8.060	8.170	8.180	8.160	.
AUG	8.300	8.250	8.210	8.210	.
SEP	8.230	8.180	8.100	8.220	.
OCT	8.240	8.200	8.190	8.200	.
NOV	8.400	8.350	8.340	8.340	.
DEC	8.240	8.040	8.030	8.030	.
PHOSPHORUS FIL REACT (MG/L)				DET'N LIMIT = 0.0005	GUIDELINE = N/A
MAY	BDL	.006	.	.	.
JUN	.001 <T	.002 <T	.	.	.
JUL	.003	.003	.	.	.
AUG	.000 <T	.002	.	.	.
SEP	BDL	.004	.	.	.
OCT	.001 <T	.007	.	.	.
NOV	BDL	.005	.	.	.
DEC	.000 <T	.000 <T	.	.	.
PHOSPHORUS TOTAL (MG/L)				DET'N LIMIT = 0.002	GUIDELINE = .40 (F2)
MAY	.007 <T	.012	.	.	.
JUN	.019	.010	.	.	.
JUL	.019	.010	.	.	.
AUG	.019	.004 <T	.	.	.
SEP	.039	.010	.	.	.
OCT	.013	.010	.	.	.
NOV	.008 <T	.009 <T	.	.	.
DEC	.013	.005 <T	.	.	.
SULPHATE (MG/L)				DET'N LIMIT = .200	GUIDELINE = 500 (A3)
MAY	24.880	26.320	.	.	.
JUN	24.900	26.930	26.770	26.680	.
JUL	25.820	28.620	28.420	28.270	.
AUG	26.000	29.480	28.980	29.440	.
SEP	26.300	29.190	29.140	28.980	.
OCT	27.100	30.130	29.760	29.300	.
NOV	26.500	29.500	29.140	29.370	.
DEC	27.870	29.440	30.060	30.360	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

		RAW	TREATED	SITE 1		
				STANDING	FREE FLOW	
TURBIDITY (FTU)				DET'N LIMIT = 0.05	GUIDELINE = 1	(A1)
MAY	1.500		.700			
JUN	2.200		.400	.990	.930	
JUL	2.100		.350	.450	.550	
AUG	2.200		.230 <T	.890	.440	
SEP	13.600		.180 <T	.590	.820	
OCT	1.040		.220 <T	.650	.360	
NOV	1.200		.270	.520	.440	
DEC	1.300		1.300	.280	.520	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW		TREATED	SITE 1	
			STANDING	FREE FLOW
METALS				
ALUMINUM (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 100 (A4)
MAY	17.000	210.000	.	.
JUN	30.000	260.000	130.000	220.000
JUL	ISM	280.000	75.000	240.000
AUG	21.000	260.000	170.000	250.000
SEP	26.000	220.000	130.000	180.000
OCT	13.000	160.000	64.000	130.000
NOV	8.200	94.000	79.000	85.000
DEC	12.000	96.000	240.000	84.000
ARSENIC (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 25 (A1)
MAY	.750 <T	.850 <T	.	.
JUN	.500 <T	.730 <T	.470 <T	.410 <T
JUL	ISM	1.000 <T	.620 <T	1.000 <T
AUG	.830 <T	.860 <T	.740 <T	1.100
SEP	.710 <T	1.200	.600 <T	.950 <T
OCT	.840 <T	.920 <T	.520 <T	.780 <T
NOV	1.300	.870 <T	.820 <T	1.000 <T
DEC	.960 <T	.990 <T	1.200	1.100
BARIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 1000 (A2)
MAY	25.000	25.000	.	.
JUN	24.000	23.000	23.000	22.000
JUL	ISM	22.000	22.000	23.000
AUG	20.000	20.000	21.000	22.000
SEP	25.000	24.000	24.000	24.000
OCT	22.000	22.000	23.000	22.000
NOV	22.000	21.000	21.000	21.000
DEC	22.000	22.000	23.000	22.000
BORON (UG/L)			DET'N LIMIT = 2.00	GUIDELINE = 5000 (A1)
MAY	26.000	28.000	.	.
JUN	33.000	32.000	26.000	31.000
JUL	ISM	34.000	35.000	35.000
AUG	33.000	33.000	33.000	41.000
SEP	36.000	36.000	36.000	35.000
OCT	27.000	27.000	29.000	27.000
NOV	26.000	26.000	26.000	29.000
DEC	28.000	29.000	25.000	28.000
CADMIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 5 (A1)
MAY	BDL	.070 <T	.	.
JUN	.090 <T	BDL	.080 <T	.060 <T
JUL	ISM	BDL	BDL	BDL
AUG	BDL	BDL	BDL	BDL
SEP	BDL	BDL	BDL	BDL
OCT	BDL	BDL	BDL	BDL
NOV	BDL	BDL	BDL	BDL
DEC	BDL	BDL	BDL	BDL

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW

TREATED

SITE 1

		STANDING		FREE FLOW
COBALT (UG/L)		DET'N LIMIT = 0.02		GUIDELINE = N/A
MAY	.220 <T	.240 <T	BDL	.050 <T
JUN	.060 <T	BDL	BDL	.130 <T
JUL	ISM	.110 <T	.040 <T	.100 <T
AUG	.060 <T	.030 <T	.090 <T	.240 <T
SEP	.310 <T	.300 <T	.300 <T	.190 <T
OCT	.130 <T	.220 <T	.180 <T	BDL
NOV	.040 <T	BDL	BDL	.070 <T
DEC	.090 <T	.110 <T	.090 <T	
CHROMIUM (UG/L)		DET'N LIMIT = 0.50		GUIDELINE = 50 (A1)
MAY	BDL	BDL		
JUN	3.000 <T	2.800 <T	1.200 <T	2.500 <T
JUL	ISM	2.500 <T	2.500 <T	2.700 <T
AUG	1.400 <T	1.500 <T	1.400 <T	2.400 <T
SEP	3.000 <T	2.700 <T	3.000 <T	2.700 <T
OCT	1.000 <T	1.100 <T	.990 <T	.920 <T
NOV	.680 <T	.580 <T	.680 <T	.910 <T
DEC	1.500 <T	1.500 <T	BDL	1.600 <T
COPPER (UG/L)		DET'N LIMIT = 0.50		GUIDELINE = 1000 (A3)
MAY	1.600 <T	1.500 <T		
JUN	3.000 <T	1.600 <T	520.000	31.000
JUL	ISM	2.400 <T	660.000	29.000
AUG	4.300 <T	2.900 <T	190.000	31.000
SEP	3.000 <T	2.700 <T	280.000	36.000
OCT	1.600 <T	2.000 <T	590.000	32.000
NOV	1.700 <T	1.800 <T	230.000	19.000
DEC	1.400 <T	1.600 <T	550.000	21.000
IRON (UG/L)		DET'N LIMIT = 6.00		GUIDELINE = 300 (A3)
MAY	29.000 <T	7.400 <T		
JUN	58.000 <T	BDL	11.000 <T	9.800 <T
JUL	ISM	BDL	20.000 <T	38.000 <T
AUG	43.000 <T	BDL	16.000 <T	12.000 <T
SEP	12.000 <T	21.000 <T	610.000	BDL
OCT	22.000 <T	BDL	41.000 <T	20.000 <T
NOV	13.000 <T	BDL	37.000 <T	30.000 <T
DEC	17.000 <T	BDL	100.000	20.000 <T
MANGANESE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 50 (A3)
MAY	4.500	2.000		
JUN	12.000	1.600	3.300	2.500
JUL	ISM	1.000	2.900	3.900
AUG	11.000	.570	2.200	1.600
SEP	10.000	.550	2.200	2.800
OCT	3.500	.500 <T	2.300	2.100
NOV	1.600	.360 <T	3.100	2.300
DEC	2.000	.530	6.200	1.800

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

		RAW	TREATED	SITE 1	
				STANDING	FREE FLOW
MOLYBDENUM (UG/L)				DET'N LIMIT = 0.05	GUIDELINE = N/A
MAY	1.100		1.200		
JUN	.920		.960	1.000	.960
JUL	ISM		1.300	1.100	1.100
AUG	1.100		1.300	1.100	1.100
SEP	1.000		1.200	1.200	1.300
OCT	1.200		1.200	1.200	1.200
NOV	1.000		1.200	1.000	1.100
DEC	1.300		1.200	1.100	1.200
NICKEL (UG/L)				DET'N LIMIT = 0.20	GUIDELINE = 350 (D3)
MAY	1.600 <T		1.900 <T		
JUN	BDL		BDL	BDL	BDL
JUL	ISM		.270 <T	.240 <T	.570 <T
AUG	1.100 <T		.980 <T	.630 <T	.520 <T
SEP	2.500		1.800 <T	2.200	1.900 <T
OCT	.800 <T		.730 <T	.820 <T	.670 <T
NOV	BDL		BDL	BDL	BDL
DEC	1.100 <T		1.100 <T	1.100 <T	1.000 <T
LEAD (UG/L)				DET'N LIMIT = 0.05	GUIDELINE = 10. (A1)
MAY	.240 <T		.160 <T		
JUN	.600		.200 <T	6.000	.950
JUL	ISM		.330 <T	2.100	.690
AUG	.720		.400 <T	5.200	.670
SEP	.410 <T		.430 <T	6.000	.610
OCT	.160 <T		.320 <T	2.800	.550
NOV	.140 <T		.690	4.300	.370 <T
DEC	.200 <T		.390 <T	14.000	.280 <T
ANTIMONY (UG/L)				DET'N LIMIT = 0.05	GUIDELINE = 146 (D4)
MAY	.560		.560		
JUN	.590		.540	.800	.650
JUL	ISM		.680	.560	.650
AUG	.360 <T		.460 <T	.470 <T	.410 <T
SEP	.490 <T		.640	.780	.760
OCT	.430 <T		.660	.520	.650
NOV	.580		.540	.570	.550
DEC	.570		.640	.670	.600
SELENIUM (UG/L)				DET'N LIMIT = 1.00	GUIDELINE = 10 (A1)
MAY	BDL		BDL		
JUN	BDL		3.100 <T	2.200 <T	2.200 <T
JUL	ISM		2.200 <T	2.000 <T	2.900 <T
AUG	BDL		BDL	BDL	3.100 <T
SEP	BDL		2.100 <T	2.200 <T	2.400 <T
OCT	BDL		BDL	BDL	BDL
NOV	1.100 <T		1.600 <T	1.500 <T	1.400 <T
DEC	BDL		BDL	1.600 <T	1.500 <T

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

		RAW	TREATED	SITE 1	
				STANDING	FREE FLOW
STRONTIUM (UG/L)				DET'N LIMIT = 0.10	GUIDELINE = N/A
MAY	180.000		180.000	.	.
JUN	180.000		180.000	180.000	180.000
JUL	ISM		190.000	190.000	180.000
AUG	170.000		170.000	170.000	180.000
SEP	190.000		190.000	190.000	190.000
OCT	170.000		180.000	180.000	180.000
NOV	160.000		160.000	160.000	170.000
DEC	180.000		180.000	180.000	180.000
TITANIUM (UG/L)				DET'N LIMIT = 0.50	GUIDELINE = N/A
MAY	7.300		7.700	.	.
JUN	4.800 <T		5.100	4.800 <T	4.800 <T
JUL	ISM		3.300 <T	3.800 <T	3.000 <T
AUG	4.400 <T		4.500 <T	4.500 <T	4.800 <T
SEP	5.400		5.100	4.400 <T	4.700 <T
OCT	2.500 <T		2.800 <T	2.400 <T	2.700 <T
NOV	2.000 <T		2.500 <T	2.300 <T	2.500 <T
DEC	3.100 <T		2.400 <T	3.400 <T	2.700 <T
URANIUM (UG/L)				DET'N LIMIT = 0.05	GUIDELINE = 100 (A1)
MAY	.280 <T		.370 <T	.	.
JUN	.270 <T		.280 <T	.180 <T	.270 <T
JUL	ISM		.270 <T	.190 <T	.310 <T
AUG	.290 <T		.300 <T	.260 <T	.280 <T
SEP	.320 <T		.350 <T	.280 <T	.320 <T
OCT	.340 <T		.340 <T	.140 <T	.300 <T
NOV	.300 <T		.280 <T	.250 <T	.330 <T
DEC	.300 <T		.300 <T	.210 <T	.310 <T
VANADIUM (UG/L)				DET'N LIMIT = 0.05	GUIDELINE = N/A
MAY	.220 <T		.220 <T	.	.
JUN	.250 <T		.190 <T	.170 <T	.240 <T
JUL	ISM		.350 <T	.250 <T	.310 <T
AUG	.320 <T		.200 <T	.210 <T	.300 <T
SEP	.470 <T		.410 <T	.420 <T	.370 <T
OCT	.250 <T		.210 <T	.140 <T	.200 <T
NOV	.290 <T		.250 <T	.200 <T	.200 <T
DEC	.190 <T		.200 <T	.240 <T	.160 <T
ZINC (UG/L)				DET'N LIMIT = 0.20	GUIDELINE = 5000 (A3)
MAY	2.200		2.100	.	.
JUN	3.800		2.300	26.000	6.500
JUL	ISM		4.000	34.000	5.000
AUG	3.400		3.400	40.000	5.400
SEP	2.200		3.100	56.000	6.500
OCT	1.700 <T		3.800	28.000	8.000
NOV	3.200		3.800	28.000	6.300
DEC	.600 <T		1.500 <T	36.000	3.700

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW		TREATED	SITE 1	
			STANDING	FREE FLOW

CHLOROAROMATICS				
HEXACHLOROETHANE (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 1900 (D4)
MAY	BDL	ILA	.	.
JUN	BDL	BDL	.	BDL
JUL	-	BDL	.	BDL
AUG	INR	BDL	.	BDL
SEP	BDL	BDL	.	BDL
OCT	BDL	BDL	.	BDL
NOV	BDL	1.000 <T	.	2.000 <T
DEC	!PE	!PE	.	1.000 <T

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW		TREATED	SITE 1	
		STANDING	FREE FLOW	
PAH				
PHENANTHRENE (NG/L)	)	DET'N LIMIT = 10.	GUIDELINE = N/A	
MAY	BDL	BDL	.	.
JUN	BDL	IIS	.	.
JUL	.	BDL	.	.
AUG	!QU	!QU	.	.
SEP	BDL	BDL	.	.
OCT	BDL	BDL	.	.
NOV	BDL	BDL	.	10.000 <1
DEC	BDL	BDL	.	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW		TREATED	SITE 1	
			STANDING	FREE FLOW

PESTICIDES & PCB				
ALPHA BHC (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 700 (G)
MAY	2.000 <T	ILA	.	.
JUN	BDL	BDL	.	BDL
JUL	.	BDL	.	1.000 <T
AUG	!NR	1.000 <T	.	1.000 <T
SEP	BDL	BDL	.	BDL
OCT	1.000 <T	1.000 <T	.	1.000 <T
NOV	1.000 <T	1.000 <T	.	1.000 <T
DEC	!PE	!PE	.	1.000 <T

LINDANE (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 4000 (A1)
MAY	BDL	ILA	.	.
JUN	BDL	BDL	.	BDL
JUL	.	BDL	.	BDL
AUG	!NR	BDL	.	BDL
SEP	BDL	BDL	.	BDL
OCT	BDL	BDL	.	BDL
NOV	BDL	BDL	.	BDL
DEC	!PE	!PE	.	2.000 <T

ATRAZINE (NG/L)			DET'N LIMIT = 50	GUIDELINE = 60000 (A2)
MAY	BDL	BDL	.	.
JUN	BDL	BDL	.	.
JUL	.	BDL	.	.
AUG	BDL	BDL	.	.
SEP	100.000 <T	90.000 <T	.	.
OCT	BDL	BDL	.	.
NOV	BDL	BDL	.	.
DEC	160.000 <T	230.000 <T	.	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW		TREATED	SITE 1	
		STANDING	FREE FLOW	
PHENOLICS (UG/L)		DET'N LIMIT = .200		GUIDELINE = 2 (A4)
PHENOLICS				
MAY	BDL	BDL	.	.
JUN	.600 <T	BDL	.	.
JUL	BDL	BDL	.	.
AUG	BDL	.600 <T	.	.
SEP	BDL	BDL	.	.
OCT	BDL	BDL	.	.
NOV	1.000	.600 <T	.	.
DEC	IRE	.800 <T	.	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW		TREATED	SITE 1	
			STANDING	FREE FLOW
VOLATILES				
BENZENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 5 (A1)
MAY	BDL	BDL	.	.
JUN	BDL	.100 <T	.	.050 <T
JUL	BDL	BDL	.	BDL
AUG	BDL	BDL	.	BDL
SEP	BDL	BDL	.	BDL
OCT	BDL	BDL	.	BDL
NOV	BDL	BDL	.	BDL
DEC	BDL	BDL	.	BDL
TOLUENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 24 (A3)
MAY	BDL	.050 <T	.	.
JUN	BDL	.050 <T	.	.050 <T
JUL	BDL	BDL	.	.050 <T
AUG	BDL	BDL	.	.050 <T
SEP	BDL	BDL	.	.100 <T
OCT	BDL	BDL	.	.100 <T
NOV	BDL	BDL	.	BDL
DEC	BDL	BDL	.	.050 <T
ETHYLBENZENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 2.4 (A3)
MAY	BDL	BDL	.	.
JUN	BDL	.150 <T	.	.150 <T
JUL	BDL	.050 <T	.	.050 <T
AUG	BDL	BDL	.	.050 <T
SEP	BDL	BDL	.	.100 <T
OCT	BDL	BDL	.	BDL
NOV	BDL	BDL	.	.050 <T
DEC	BDL	BDL	.	.050 <T
M-XYLENE (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 300 (A3*)
MAY	BDL	BDL	.	.
JUN	BDL	BDL	.	.200 <T
JUL	BDL	BDL	.	BDL
AUG	BDL	BDL	.	BDL
SEP	BDL	BDL	.	.400 <T
OCT	BDL	BDL	.	BDL
NOV	BDL	BDL	.	BDL
DEC	BDL	BDL	.	BDL
O-XYLENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 300 (A3*)
MAY	BDL	BDL	.	.
JUN	BDL	BDL	.	BDL
JUL	BDL	BDL	.	BDL
AUG	BDL	BDL	.	.050 <T
SEP	BDL	BDL	.	.250 <T
OCT	BDL	BDL	.	BDL
NOV	BDL	BDL	.	BDL
DEC	BDL	BDL	.	BDL

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW

TREATED

SITE 1

		STANDING		FREE FLOW	
STYRENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 100 (D1)	
MAY	BDL	BDL	.	.	.
JUN	BDL	.250 <T	.	.050 <T	.
JUL	BDL	.050 <T	.	.100 <T	.
AUG	BDL	BDL	.	.100 <T	.
SEP	BDL	BDL	.	BDL	.
OCT	BDL	BDL	.	.050 <T	.
NOV	.050 <T	BDL	.	.050 <T	.
DEC	BDL	BDL	.	.100 <T	.
CHLOROFORM (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 350 (A1+)	
MAY	BDL	24.700	.	.	.
JUN	BDL	26.500	.	25.400	.
JUL	BDL	22.900	.	19.900	.
AUG	BDL	24.100	.	17.000	.
SEP	BDL	14.200	.	12.900	.
OCT	BDL	10.100	.	9.100	.
NOV	BDL	7.700	.	7.900	.
DEC	BDL	10.300	.	8.700	.
111, TRICHLOROETHANE (UG/L)		DET'N LIMIT = 0.02		GUIDELINE = 200 (D1)	
MAY	BDL	BDL	.	.	.
JUN	BDL	BDL	.	BDL	.
JUL	BDL	BDL	.	BDL	.
AUG	BDL	BDL	.	BDL	.
SEP	BDL	BDL	.	BDL	.
OCT	BDL	BDL	.	.100 <T	.
NOV	BDL	BDL	.	BDL	.
DEC	BDL	BDL	.	BDL	.
DICHLOROBROMOMETHANE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 350 (A1+)	
MAY	BDL	13.950	.	.	.
JUN	BDL	15.600	.	14.450	.
JUL	BDL	15.300	.	14.200	.
AUG	BDL	14.800	.	15.050	.
SEP	BDL	12.300	.	11.400	.
OCT	BDL	10.700	.	10.050	.
NOV	BDL	9.150	.	9.400	.
DEC	BDL	10.250	.	9.400	.
CHLORODIBROMOMETHANE (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 350 (A1+)	
MAY	BDL	4.900	.	.	.
JUN	BDL	6.400	.	6.000	.
JUL	BDL	7.700	.	7.400	.
AUG	BDL	9.000	.	10.100	.
SEP	BDL	8.100	.	7.800	.
OCT	BDL	7.900	.	7.800	.
NOV	BDL	7.800	.	8.400	.
DEC	BDL	6.900	.	6.400	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM PRESCOTT WTP 1990

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW		TREATED		SITE 1	
		STANDING		FREE FLOW	
T-CHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 5 (D1)	
MAY	BDL	BDL	.	.	
JUN	BDL	BDL	.	.100	<T
JUL	BDL	BDL	.	.100	<T
AUG	BDL	BDL	.	.050	<T
SEP	BDL	BDL	.	.500	
OCT	BDL	BDL	.	.800	
NOV	BDL	BDL	.	.050	<T
DEC	BDL	BDL	.	BDL	
BROMOFORM (UG/L)		DET'N LIMIT = 0.20		GUIDELINE = 350 (A1+)	
MAY	BDL	.400	<T	.	
JUN	BDL	.600	<T	.	.400 <T
JUL	BDL	.600	<T	.	.600 <T
AUG	BDL	1.200	<T	.	1.600 <T
SEP	BDL	1.200	<T	.	1.200 <T
OCT	BDL	1.400	<T	.	1.400 <T
NOV	BDL	1.200	<T	.	1.200 <T
DEC	BDL	1.000	<T	.	1.200 <T
TOTL TRIHALOMETHANES (UG/L)		DET'N LIMIT = 0.50		GUIDELINE = 350 (A1)	
MAY	BDL	43.850	.	.	
JUN	BDL	49.000	.	46.300	
JUL	BDL	46.500	.	42.100	
AUG	BDL	49.100	.	43.750	
SEP	BDL	35.750	.	33.300	
OCT	BDL	30.100	.	28.300	
NOV	BDL	25.850	.	26.950	
DEC	BDL	28.500	.	25.550	

TRACE LEVELS OF TOLUENE ARE LABORATORY ARTIFACTS DERIVED FROM THE ANALYTICAL METHODOLOGY.

TRACE LEVELS OF STYRENE ARE CONSIDERED TO BE LABORATORY ARTIFACTS RESULTING FROM THE LABORATORY SHIPPING CONTAINERS.

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BACTERIOLOGICAL			
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0 (A1)
STANDARD PLATE COUNT MEMBRANE FILT.	CT/ML	0	500/ML (A3)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100ML (A1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	0	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	0	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	0	N/A
FIELD PH	DMNSLESS	N/A	6.5-8.5 (A3)
FIELD TEMPERATURE	DEG.C	N/A	15.0 (A3)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	0.2	30-500 (A3)
AMMONIUM TOTAL	MG/L	0.002	0.05 (F2)
CALCIUM	MG/L	0.2	100 (F2)
CHLORIDE	MG/L	0.2	250 (A3)
COLOUR	TCU	0.5	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.0	400 (F2)
CYANIDE	MG/L	0.001	0.2 (A1)
DISSOLVED ORGANIC CARBON	MG/L	0.1	5.0 (A3)
FLUORIDE	MG/L	0.01	2.4 (A1)
HARDNESS	MG/L	0.5	80-100 (A4)
LANGELIERS INDEX	DMNSLESS	N/A	N/A
MAGNESIUM	MG/L	0.1	30.0 (F2)
NITRITE	MG/L	0.001	1.0 (A1)
NITROGEN TOTAL KJELDAHL	MG/L	0.02	N/A
PH	DMNSLESS	N/A	6.5-8.5 (A4)
PHOSPHORUS FIL REACT	MG/L	0.0005	N/A
PHOSPHORUS TOTAL	MG/L	0.002	0.4 (F2)
SODIUM	MG/L	0.2	200 (A4)
SULPHATE	MG/L	0.2	500 (A3)
TOTAL NITRATES	MG/L	0.005	10.0 (A1)
TURBIDITY	FTU	0.05	1.0 (A1)
CHLOROAROMATICS			
123 TRICHLOROBENZENE	NG/L	5.0	N/A
1234 TETRACHLOROBENZENE	NG/L	1.0	N/A
1235 TETRACHLOROBENZENE	NG/L	1.0	N/A
124 TRICHLOROBENZENE	NG/L	5.0	10000 (1)
1245-TETRACHLOROBENZENE	NG/L	1.0	38000 (D4)
135 TRICHLOROBENZENE	NG/L	5.0	N/A
236 TRICHLOROTOLUENE	NG/L	5.0	N/A
245 TRICHLOROTOLUENE	NG/L	5.0	N/A
26A TRICHLOROTOLUENE	NG/L	5.0	N/A
HEXACHLOROBENZENE	NG/L	1.0	10 (C1)
HEXACHLOROBUTADIENE	NG/L	1.0	450 (D4)
HEXACHLOROCYCLOPENTADIENE	NG/L	5.0	206000 (D4)
HEXACHLOROETHANE	NG/L	1.0	1900 (D4)
OCTACHLOROSTYRENE	NG/L	1.0	N/A
PENTACHLOROBENZENE	NG/L	1.0	74000 (D4)
CHLOROPHENOLS			
234 TRICHLOROPHENOL	NG/L	100.0	N/A
2345 TETRACHLOROPHENOL	NG/L	20.0	N/A
2356 TETRACHLOROPHENOL	NG/L	10.0	N/A

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
245 TRICHLOROPHENOL	NG/L	100.0	2600000 (D4)
246 TRICHLOROPHENOL	NG/L	20.0	5000 (A1)
PENTACHLOROPHENOL	NG/L	10.0	60000 (A1)
METALS			
ALUMINUM	UG/L	0.10	100 (A4)
ANTIMONY	UG/L	0.05	146 (D4)
ARSENIC	UG/L	0.10	25 (A1)
BARIUM	UG/L	0.05	1000 (A2)
BERYLLIUM	UG/L	0.05	6800 (D4)
BORON	UG/L	2.00	5000 (A1)
CADMIUM	UG/L	0.05	5 (A1)
CHROMIUM	UG/L	0.50	50 (A1)
COBALT	UG/L	0.02	N/A
COPPER	UG/L	0.50	1000 (A3)
IRON	UG/L	6.00	300 (A3)
LEAD	UG/L	0.05	10 (A1)
MANGANESE	UG/L	0.05	50 (A3)
MERCURY	UG/L	0.02	1 (A1)
MOLYBDENUM	UG/L	0.05	N/A
NICKEL	UG/L	0.20	350 (D3)
SELENIUM	UG/L	1.00	10 (A1)
SILVER	UG/L	0.05	50 (A1)
STRONTIUM	UG/L	0.10	N/A
THALLIUM	UG/L	0.05	13 (D4)
TITANIUM	UG/L	0.50	N/A
URANIUM	UG/L	0.05	100 (A1)
VANADIUM	UG/L	0.05	N/A
ZINC	UG/L	0.20	5000 (A3)
PAH			
ANTHRACENE	NG/L	1.0	N/A
BENZO(A) ANTHRACENE	NG/L	20.0	N/A
BENZO(A) PYRENE	NG/L	5.0	10.0 (A1)
BENZO(B) CHRYSENE	NG/L	2.0	N/A
BENZO(B) FLUORANTHENE	NG/L	10.0	N/A
BENZO(E) PYRENE	NG/L	50.0	N/A
BENZO(G,H,I) PERYLENE	NG/L	20.0	N/A
BENZO(K) FLUORANTHENE	NG/L	1.0	N/A
CHRYSENE	NG/L	50.0	N/A
CORONENE	NG/L	10.0	N/A
DIBENZO(A,H) ANTHRACENE	NG/L	10.0	N/A
DIMETHYL BENZO(A) ANTHRACENE	NG/L	5.0	N/A
FLUORANTHENE	NG/L	20.0	42000.0 (D4)
INDENO(1,2,3-C,D) PYRENE	NG/L	20.0	N/A
PERYLENE	NG/L	10.0	N/A
PHENANTHRENE	NG/L	10.0	N/A
PYRENE	NG/L	20.0	N/A
PESTICIDES & PCB			
ALACHLOR (LASSO)	NG/L	500.0	5000 (A2)
ALDRIN	NG/L	1.0	700 (A1)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700 (G)
ALPHA CHLORDANE	NG/L	2.0	7000 (A1)
AMETRINE	NG/L	50.0	300000 (D3)
ATRATONE	NG/L	50.0	N/A
ATRAZINE	NG/L	50.0	60000 (A2)
DES ETHYL ATRAZINE	NG/L	200.0	60000 (A2)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300 (G)
CYANAZINE (BLADEX)	NG/L	100.0	10000 (A2)
O,P-DDD	NG/L	5.0	10 (I)
DIELDRIN	NG/L	2.0	700 (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000 (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	5.0	74000 (D4)

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	5.0	N/A
ENDRIN	NG/L	5.0	1600 (D3)
GAMMA CHLORDANE	NG/L	2.0	7000 (A1)
HEPTACHLOR	NG/L	1.0	3000 (A1)
HEPTACHLOR EPOXIDE	NG/L	1.0	3000 (A1)
LINDANE (GAMMA BHC)	NG/L	1.0	4000 (A1)
METHOXYCHLOR	NG/L	5.0	900000 (A1)
METOLACHLOR	NG/L	500.0	50000 (A2)
METRIBUZIN (SENCOR)	NG/L	100.0	80000 (A1)
MIREX	NG/L	5.0	N/A
P,P-DDD	NG/L	5.0	N/A
O,P-DDT	NG/L	5.0	30000 (A1)
OXYCHLORDANE	NG/L	2.0	N/A
PCB	NG/L	20.0	3000 (A2)
PPDDE	NG/L	1.0	30000 (A1)
PPDDT	NG/L	5.0	30000 (A1)
PROMETONE	NG/L	50.0	52500 (D3)
PROMETRYNE	NG/L	50.0	1000 (A2)
PROPACINE	NG/L	50.0	700000 (D3)
SIMAZINE	NG/L	50.0	10000 (A2)
D-ETHYL SIMAZINE	NG/L	200.0	10000 (A2)
TOXAPHENE	NG/L	500.0	5000 (A1)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	0.2	2 (A4)
SPECIFIC PESTICIDES			
2,4 D PROPIONIC ACID	NG/L	100.	N/A
2,4,5-TRICHLOROPHENOXY ACETIC ACID	NG/L	50.	280000 (A1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.	100000 (A1)
2,4-DICHLOROPHENOXYBUTYRIC ACID (2,4-DB)	NG/L	200.	18000 (B3)
BUTYLATE (SUTAN)	NG/L	2000.	245000 (D3)
CARBARYL (SEVIN)	NG/L	200.	90000 (A1)
CARBOFURAN	NG/L	2000.	90000 (A1)
CHLORPYRIFOS (DURSBAN)	NG/L	20.	N/A
CICP (CHLORPROPHAM)	NG/L	2000.	350000 (G)
DIALLATE	NG/L	2000.	N/A
DIAZINON	NG/L	20.	20000 (A1)
DICAMBA	NG/L	50.	120000 (A1)
DICHLOROVOS	NG/L	20.	N/A
EPTAM	NG/L	2000.	N/A
ETHION	NG/L	20.	35000 (G)
IPC	NG/L	2000.	N/A
MALATHION	NG/L	20.	190000 (A1)
METHYL PARATHION	NG/L	50.	7000 (B3)
METHYLTRITHION	NG/L	20.	N/A
MEVINPHOS	NG/L	20.	N/A
PARATHION	NG/L	20.	50000 (A1)
PHORATE (THIMET)	NG/L	20.	2000 (A2)
PROPOXUR (BAYGON)	NG/L	2000.	140000 (D3)
RELDAN	NG/L	20.	N/A
RONNEL	NG/L	20.	N/A
SILVEX (2,4,5-TP)	NG/L	20.	10000 (A1)
VOLATILES			
1,1 DICHLOROETHANE	UG/L	0.10	N/A
1,1 DICHLOROETHYLENE	UG/L	0.10	7 (D1)
1,2 DICHLOROBENZENE	UG/L	0.05	200 (A1)
1,2 DICHLOROETHANE	UG/L	0.05	5 (A1)

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
1,2 DICHLOROPROPANE	UG/L	0.05	5 (D1)
1,3 DICHLOROBENZENE	UG/L	0.10	3750 (D3)
1,4 DICHLOROBENZENE	UG/L	0.10	5 (A1)
111, TRICHLOROETHANE	UG/L	0.02	200 (D1)
112 TRICHLOROETHANE	UG/L	0.05	0.6 (D4)
1122 TETRACHLOROETHANE	UG/L	0.05	0.17(D4)
BENZENE	UG/L	0.05	5 (A1)
BROMOFORM	UG/L	0.20	350 (A1+)
CARBON TETRACHLORIDE	UG/L	0.20	5 (A1)
CHLOROBENZENE	UG/L	0.10	1510 (D3)
CHLORODIBROMOMETHANE	UG/L	0.10	350 (A1+)
CHLOROFORM	UG/L	0.10	350 (A1+)
DICHLOROBROMOMETHANE	UG/L	0.05	350 (A1+)
ETHYLENE DIBROMIDE	UG/L	0.05	50 (D1)
ETHYLBENZENE	UG/L	0.05	2.4 (A3)
M-XYLENE	UG/L	0.10	300 (A3*)
METHYLENE CHLORIDE	UG/L	0.50	50 (A1)
O-XYLENE	UG/L	0.05	300 (A3*)
P-XYLENE	UG/L	0.10	300 (A3*)
STYRENE	UG/L	0.05	100 (D1)
TETRACHLOROETHYLENE	UG/L	0.05	5 (D1)
TRANS 1,2 DICHLOROETHYLENE	UG/L	0.10	70 (D1)
TOLUENE	UG/L	0.05	24 (A3)
TOTAL TRIHALOMETHANES	UG/L	0.50	350 (A1)
TRICHLOROETHYLENE	UG/L	0.10	50 (A1)

Appendix A

DRINKING WATER SURVEILLANCE PROGRAM PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1990, 76 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment (MOE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

DATA REPORTING MECHANISM

When the analytical results are transferred from the MOE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOE District Officer, the appropriate operational staff and are also retained by the DWSP unit.

PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

Program Input - Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired through a questionnaire and an initial plant visit. During the initial assessment of the plant and distribution system, questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The Plant and Distribution System Description consists of the following seven components:

1. PROCESS COMPONENT INVENTORY

All physical and chemical processes to which the water is subjected, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. TREATMENT CHEMICALS

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. Chemical dosages applied on the day of sampling are recorded in DWSP.

3. PROCESS CONTROL MEASUREMENTS

Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. Except for the recorded Field Data, in-plant monitoring results are not retained in DWSP but are retained by the water treatment plant personnel.

4. DESIGN FLOW AND RETENTION TIME

Hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. Maximum, minimum and average flow, as well as a record of the flow rate on the day of sampling, are recorded in DWSP.

5. DISTRIBUTION SYSTEM DESCRIPTION

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

6. SAMPLING SYSTEM

Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

- i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;
- ii/ the water being sampled is not being modified by the sampling system;
- iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and
- iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake,

discharge and tap); pump characteristics (model, type, capacity); and flow rate.

7. PERSONNEL

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOE personnel associated with the plant.

Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOE offices is being developed by the DWSP group.

Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOE Regional needs and to respond to public requests.

Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

MOE - DRINKING WATER ASSESSMENT PROGRAM (DWSP)

PARAMETER REFERENCE INFORMATION

BENZENE (B2001P)

VOLATILES

CLASS: HEALTH METHOD: POCODO UNIT: $\mu\text{g/L}$

SOURCE	FROM	TO	METHOD	GUIDELINE	UNIT	NOTE
CAL C	85/01			0.700	$\mu\text{g/L}$	AL
CDWG C	87/01			5.000	$\mu\text{g/L}$	MAC
EPA C	87/07			5.000	$\mu\text{g/L}$	MCL
EPAA C	80/11			6.600	$\mu\text{g/L}$	AMBIENT **
FERC C	84/05			1.000	$\mu\text{g/L}$	MCL
WHO C	84/01			10.000	$\mu\text{g/L}$	GV

DESCRIPTION: NAME: BENZENE

CAS#: 71-43-2

MOLECULAR FORMULAE: C_6H_6

DETECTION LIMIT: (FOR METHOD POCODO) 0.05 $\mu\text{g/L}$

SYNONYMS: BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27).
CYCLOHEXATRIENE (41).

CHARACTERISTICS: COLOURLESS TO LIGHT-YELLOW, MOBILE, NON-POLAR LIQUID, OF HIGHLY REFRACTIVE NATURE,
AROMATIC ODOUR; VAPOURS BURN WITH SMOKING FLAME (30).

PROPERTIES: SOLUBILITY IN WATER: 1780-1800 mg/L AT 25C (41).
THRESHOLD ODOUR: 0.5 - 10 PPM IN WATER
THRESHOLD TASTE: 0.5 mg/L IN WATER (39).

ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES, SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM SOILS OR ARE DEGRADED RATHER QUICKLY (80).

SOURCES: COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES; COMBUSTION OF CAR EXHAUST.
ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF.

USES: DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF

OTHER COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING AGENT; GASOLINE.

TOXICITY: RATING: 4 (VERY TOXIC).

ACUTE: IRRITATING TO MUCOUS MEMBRANES; SYMPTOMS INCLUDE RESTLESSNESS, CONVULSIONS, EXCITEMENT, DEPRESSION; DEATH MAY FOLLOW RESPIRATORY FAILURE. CHRONIC: MAY CAUSE ANAEMIA AND LEUKAEMIA (45); MUTAGENIC.

MODE OF ACTION: CHROMOABERRATION IN LYMPHOCYTE CULTURES.

CARCINOGENICITY: A KNOWN HUMAN CARCINOGEN.

REMOVAL: THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN REMOVING BENZENE FROM WASTEWATER: GAC ADSORPTION, PRECIPITATION WITH ALUM AND SUBSEQUENT REMOVAL VIA SEDIMENTATION, COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION, OXIDATION

ADDITIONAL PROPERTIES:

MOLECULAR WEIGHT: 78.12

MELTING POINT: 5.5°C (27).

BOILING POINT: 80.1°C (27).

SPECIFIC GRAVITY: 0.8790 AT 20°C (27).

VAPOUR PRESSURE: 100 MM AT 26.1°C (27).

HENRY'S LAW CONSTANT: 0.00555 ATM-M3/MOLE (41).

LOG OCT./WATER PARTITION COEFFICIENT: 1.95 TO 2.13 (39).

CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3 (41) SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA

NOTES: EPA PRIORITY POLLUTANT.

Appendix B

DWSP SAMPLING GUIDELINE

i) Raw and Treated at Plant

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-220 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (Caution: HNO_3 is corrosive)
Volatiles (duplicates) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle -fill bottle completely without bubbles
Organics (OWOC), (OWTRI), (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -when 'special pesticides' are requested three extra bottles must be filled
Cyanide	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops sodium hydroxide (NaOH) (Caution: NaOH is corrosive)

Mercury	-250 mL glass bottle -rinse bottle and cap three times -fill to top of label -add 20 drops each nitric acid (HNO_3) and potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$) (Caution: HNO_3 & $\text{K}_2\text{Cr}_2\text{O}_7$ are corrosive)
Phenols	-250 mL glass bottle -do <u>not</u> rinse bottle, preservative has been added -fill to top of label
Radionuclides (as scheduled)	-4 L plastic jug -do <u>not</u> rinse, carrier added -fill to 5 cm from top
Organic Characterization (GC/MS - once per year)	-1 L amber glass bottle; instructions as per organic -250 mL glass bottle -do <u>not</u> rinse bottle -fill completely without bubbles

Steps:

1. Let sampling water tap run for an adequate time to clear the sample line.
2. Record time of day on submission sheet.
3. Record temperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.

ii) Distribution Samples (standing water)

- | | |
|-------------------|---|
| General Chemistry | -500 mL plastic bottle (PET 500)
-rinse bottle and cap with sample water three times
-fill to 2 cm from top |
| Metals | -500 mL plastic bottle (PET 500)
-rinse bottle and cap three times
-fill to 2 cm from top
-add 10 drops nitric acid (HNO_3)
(Caution: HNO_3 is corrosive) |

Steps:

1. Record time of day on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.
5. Fill general chemistry and metals bottles.
6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

- | | |
|-------------------|--|
| General Chemistry | -500 mL plastic bottle (PET 500)
-rinse bottle and cap with sample water three times
-fill to 2 cm from top |
| Bacteriological | -250 mL plastic bottle with white seal on cap
-do <u>not</u> rinse bottle, preservative has been added
-avoid touching bottle neck or inside of cap
-fill to top of red label as marked |

Metals

- 500 mL plastic bottle (PET 500)
- rinse bottle and cap three times
- fill to 2 cm from top
- add 10 drops nitric acid HNO_3
(Caution: HNO_3 is corrosive)

Volatiles (duplicate)
(OPOPUP)

- 45 mL glass vial with septum
(teflon side must be in contact
with sample)
- do not rinse bottle, preservative
has been added
- fill bottle completely without
bubbles

Organics
(OWOC) (OAPAHX)

- 1 L amber glass bottle per scan
- do not rinse bottle
- fill to 2 cm from top

Steps:

1. Record time of day on submission sheet.
2. Let cold water flow for five minutes.
3. Record temperature on submission sheet.
4. Fill all bottles as per instructions.
5. Record chlorine residuals (free, combined and total),
turbidity and pH on submission sheet.

